The Amateur in You, Part 2

What have you been pondering?

Setting up and operating FT8 on a Yaesu FT-991A

Many hams have asked how to set up and operate FT8, and there are numerous videos, web pages, and other helps on how to get that done. Still, I felt it was worthwhile to create a written reference for the process, because enough people have asked for one that included links, and walked the operator from absolute start to making contacts.

But there's a catch: this discussion should ideally explain how to do this for *any transceiver*, but if I attempted that, this article would have ended up being quite lengthy. So, I'm going to focus on one, the Yaesu FT-991A, which makes it easy because of its built-in TNC / sound card. In fact, there are many modern transceivers with this built-in device, so it's not completely unreasonable to expect that you too might have one. I've written a separate article for the Icom IC-7300.
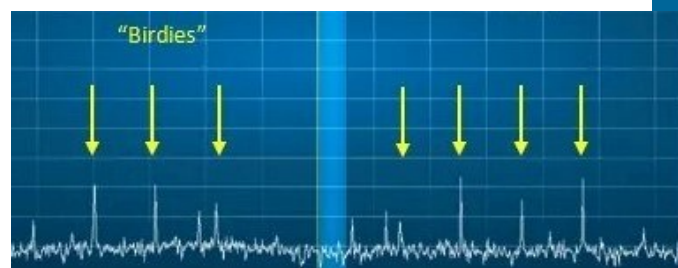
One caveat I need to state is that, although the links I've provided are valid at the time of this writing, some of them point to retail locations that could change without much notice. Hopefully, I've described enough detail to help you find the parts or the information without their links. And speaking of details, this little guide will not explain *every detail*.

Gather the pieces

You'll need to collect a few things, to set up your FT8 station, starting with a computer running Windows 7 or later. In this example, I'm using my HP ProBook laptop running 64-bit Microsoft Windows 10 Pro with 12 GB of memory. I only provide this so you'll know what I'm using, not because you need to duplicate my exact setup.

Next, you'll need an amateur station made from a Yaesu FT-991A transceiver, plus an accompanying power supply, HF antenna, and coaxial cable. The tuner is built into the transceiver, so no need to get another.

Finally, you'll need to purchase a high-quality USB type B cable. An unshielded or otherwise cheaply made USB cable can result in your receiver signals mixing with harmonics, affectionately known as *birdies*.

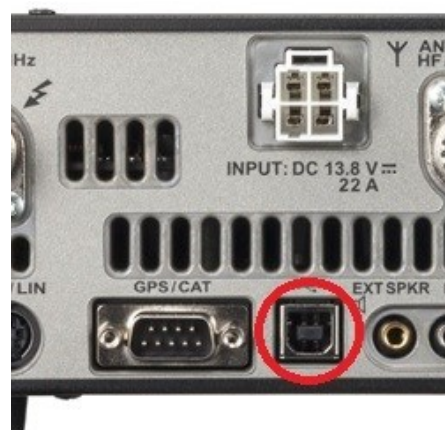# The Amateur in You, Part 2

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Pair your computer with the transceiver

First, make sure your USB cable is recognized by both your computer and the FT-991A. Turn on the FT-991A and plug the USB type B end of the cable into the rear of the FT-991A. Next,
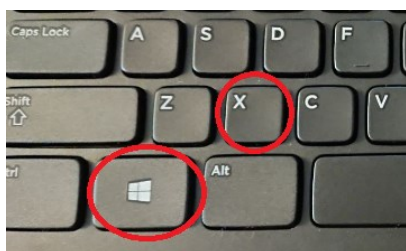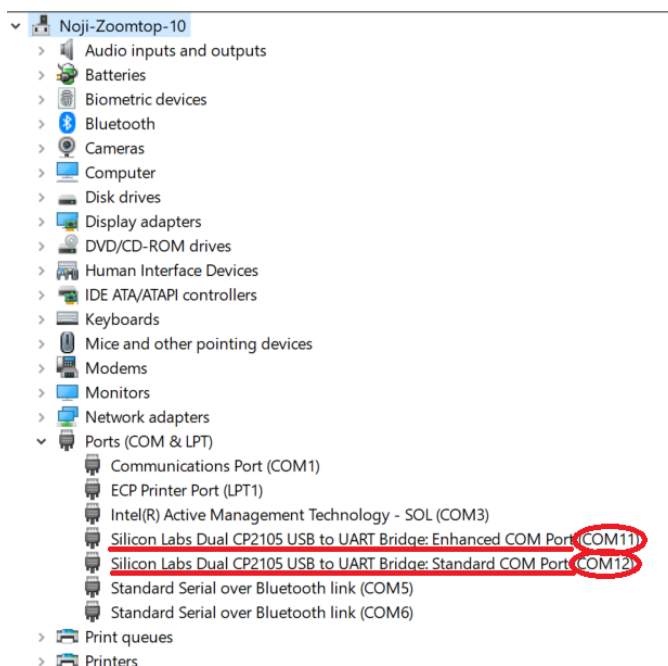

USB type B plug

turn on your computer, and once Windows is fully up and running, plug the other end of the cable into your computer USB port. Press <Windows-x> on your keyboard. (While holding the Windows key, press x)

USB port (socket) in the rear of the FT-991A

Click Device Manager. In the Device Manager window, click the little greater-than sign (>) in front of "Ports (COM & LPT)" to display the COM port numbers. The FT-991A should appear under the Ports list as "Silicon Labs Dual CP2105 USB to UART Bridge" or similar, in two lines. If you see these lines, but not in the Ports (COM & LPT) list, you'll need to install the Yaesu FT-991A USB driver, which you can download from the Silicon Labs website.

Record (write down or remember) the COM port numbers listed after the driver name. In my case they're COM11 and COM12.

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Set up the transceiver

Ensure an antenna feed line (coaxial cable) is plugged into the **HF/50 MHz** antenna connector on the rear of the FT-991A, and that the other end of the feed line is connected to an antenna. On the FT-991A press the **MENU** button. Change each of the following settings by rotating the **MULTI** knob, then tap **SELECT** to modify, turn the **MULTI** knob to scroll through the possible settings, then tap **ENTER** to save the setting:

- 029 : 232C RATE = 19200

- 030 : 232C TOT = 100msec

- 031 : CAT RATE = 9600bps

- 032 : CAT TOT = 100msec

- 033 : CAT RTS = DISNABLE

- 060 : PC KEYING = OFF

- 062 : DATA MODE = OTHERS

- 064 : OTHER DISP (SSB) = 1500

- 065 : OTHER SHIFT (SSB) = 1500

- 066 : DATA LCUT FREQ = OFF

- 068 : DATA HCUT FREQ = OFF

- 072 : DATA PORT SELECT = USB

- 106 : SSB MIC SELECT = REAR

- 108 : SSB PTT SELECT = RTS

- 109 : SSB PORT SELECT = USB

- 110 : SSB TX BPF = 100-3000

- 111 : APF WIDTH = NARROW

Press **MENU** to exit the setup menu. Press the **F** button and ensure the following filters are turned **OFF**:

- NOTCH

- CONT

- DNR

- DNF

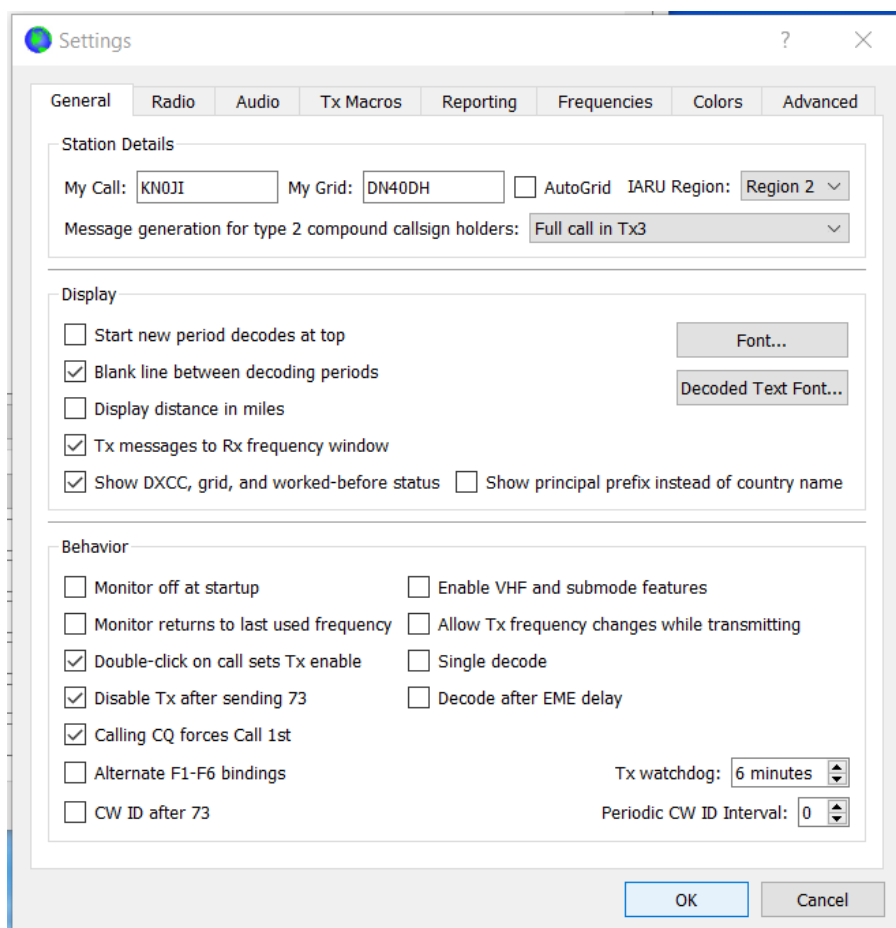# The Amateur in You, Part 2

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Set up the software

Download and install WSJT-X for Windows from the WSJT-X website onto your computer. (The page also contains the installation files for Linux and Mac.) Here is the online manual.

Open the WSJT-X software and click **File**, then **Settings...**, then click the **General** tab. Enter or select the following settings:

◇ **My Call: KNØJI** (your call sign)

◇ **IARU Region: Region 2**

◇ **My Grid: DN4ØDH** (your six-character grid...click here to find yours)

In the **Display** and **Behavior** groups, you can leave the settings at default, or check these for now, then modify them later, as you become familiar with the software:

◇ **Blank line between decoding periods**

◇ **Double-click on call sets Tx enable**

◇ **Tx messages to Rx frequency window**

◇ **Disable Tx after sending 73**

◇ **Show DXCC, grid, and worked-before status**

◇ **Calling CQ forces Call 1st**

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Click the **Radio** tab and set the following:

- **Rig: Yaesu FT-991**
- **Serial Port:** (select the COM port displayed in Device Manager, **COM11** in my case)
- **Baud Rate: 9600**
- **Data Bits = Eight**
- **Stop Bits = Two**
- **Handshake = Default**
- **PTT Method = RTS**
- **Port: COM12**
- **Mode = USB**
- **Split Operation = None**

Click the **Audio** tab and select the following:

- **Input: Microphone (2- USB Audio CODEC)**
- **Output: Speakers (2- USB Audio CODEC)**

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Go back to the **Radio** tab and click the **Test CAT** button. If the button turns green, you've set up everything successfully. If it doesn't, or an error message is displayed, try going back and ensuring the settings are as you see listed here. Click the **Test PTT** button, and the transceiver will go into a test transmit. Click **OK** to save your settings and exit the **Settings** window.

On your computer, open the ***Control Panel***, click **Sound**, then click the **Recording** tab. Click the microphone associated with the 2- USB Audio CODEC, then click **Properties**. Click the **Levels** tab and ensure the slider is between **40** and **70**, then click **OK** to exit.

Open your browser and download and install NetTime to ensure that your computer time is synchronized with internet time, important to the software.
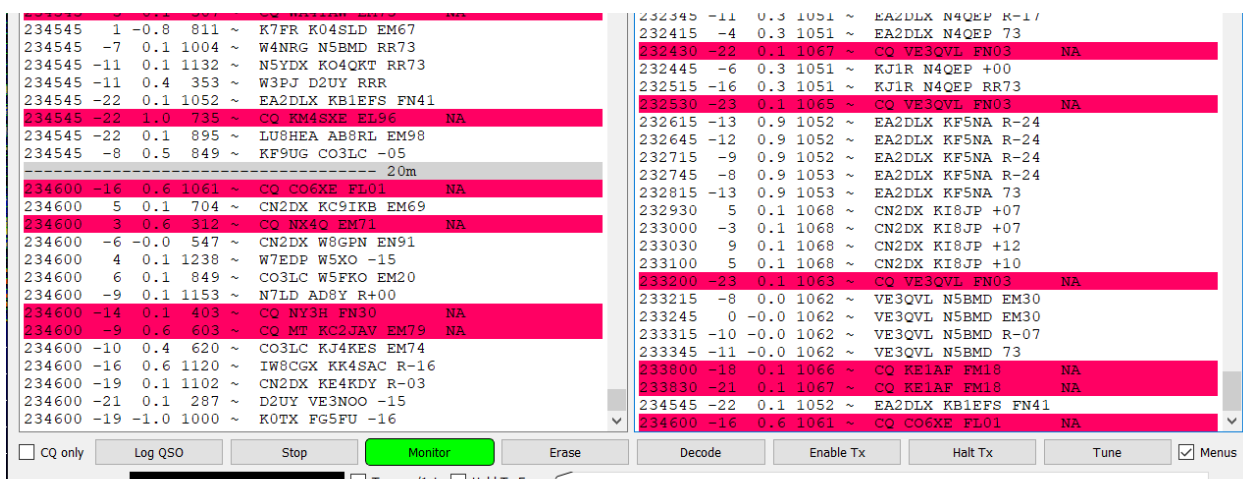
Making contacts

Open WSJT-X and connect with your transceiver. Click the **Mode** tab and select **FT8**. On your FT-991A, select one of the following:

3.573 MHz (80 meters)	**21.074 MHz** (15 meters)
7.074 MHz (40 meters)	**28.074 MHz** (10 meters)
10.136 MHz (30 meters)	**50.313 MHz** (6 meters)
14.074 MHz (20 meters)	**144.174 MHz** (2 meters)

Once the WSJT-X window is up, it'll display a graphical waterfall window and a dialog window. The dialog window is split into the left ("Band Activity") box and the right ("Rx Frequency") box. The left box displays everything that FT8 picks up ("decodes"), while the right box shows those near your target frequency and those that include your call sign.

By the way, although the graphic waterfall window is fun and informative, it's not necessary to the initial setup of FT8, and so is not covered here, but is useful for knowing where to start transmitting. Also, there are many useful and shortcut settings (colors, logging, frequencies, etc.) in WSJT-X that I haven't covered here.
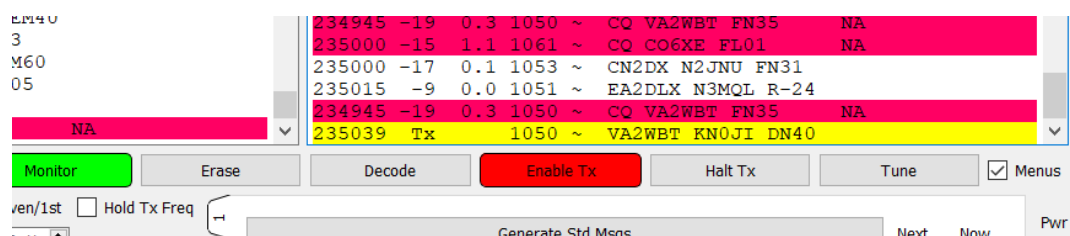

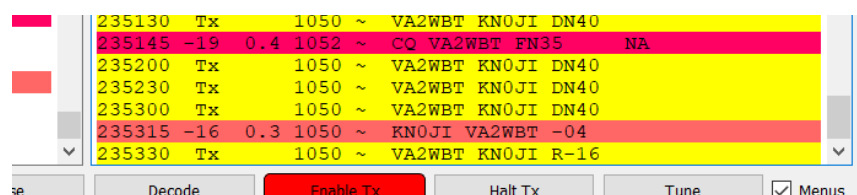*WSJT-X showing several stations throwing out CQs*
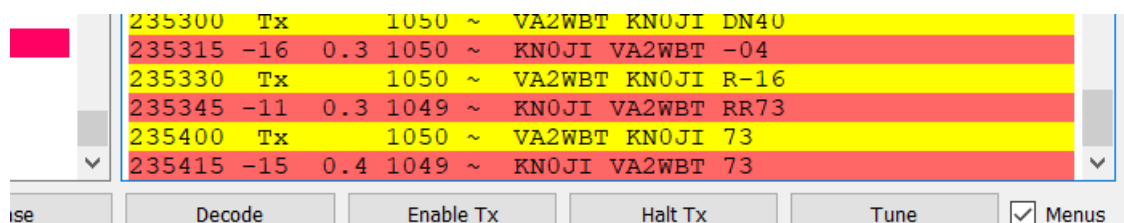
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When you see somebody calling CQ in the left box, double-click on that CQ line. The software will make repeated attempts (displayed in the right box) to answer the CQ via your transceiver by populating the list of *standard messages*, then sending the standard messages in the order listed. Upon receiving the "73" message from the other station, the software will stop making the contact attempts, send its own "73" message, and you've just completed a contact:

I double-clicked the CQ by VA2WBT in the left box; my attempt appears in the right box

VA2WBT finally acknowledged my reply to his CQ!

After exchanging signal reports, we send 73 to each other, and the QSO is over

When you want to change bands, simply press the **BAND** button, then select the new band. The software will automatically switch to the new band. When you're ready to quit FT8, click the **Stop** button on the WSJT-X dialogue window. To restart FT8, simply click the **Mode** tab in the software, then **FT8**. *Remember to turn on the transceiver before starting WSJT-X.*

Another fun and useful app you can install as an add-on to WSJT-X is *JT Alert*. It's quite useful, presents many logging options, and can audibly alert you to a potential contact. You can set the software to alert you to a CQ from countries, prefixes, continents, grids, states, and even call signs with which you might have been wanting to make a contact.

A big thanks to Shawn Hatfield KJ7SNE and Dave Becar KI6OSS for their help on this project!

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